SNCB MCZ Advice Project –Assessing the scientific confidence in the presence and extent of features in recommended Marine Conservation Zones (Technical Protocol E)

Version control

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Part 1: About this protocol

Introduction

The regional Marine Conservation Zone (MCZ) projects submitted their MCZ recommendations to the Joint Nature Conservation Committee (JNCC) and Natural England on the 7th September 2011. These reports list the recommended MCZs (rMCZs) to meet the guidelines set out in the Ecological Network Guidance (ENG) (Natural England & JNCC 2010). One of the network design principles outlined in the Defra Guidance Note 1 is the use of best available evidence in Marine Protected Area (MPA) identification, recommendation and designation (Defra 2010). The Ecological Network Guidance provides practical guidelines to meet this principle[1].

The use of best available evidence is a vital element of building an ecologically coherent MPA network and where there is scientific uncertainty a precautionary approach should be taken (see Defra 2010). That is, the best available information should be used to make decisions rather than waiting for new and potentially improved information. Postponing decisions in anticipation of new information can make network development more difficult and costly, and can lead to further degradation of features the network is aiming to protect. However, we must recognise uncertainties in our knowledge and decisions should be balanced with the need to ensure effective protection and the achievement of the Ecological Network Guidance guidelines.

The regional MCZ project teams have worked with their stakeholder groups and the national project team in JNCC and Natural England to find, and use, as many data as possible during discussions on site identification and recommendation. For the broad-scale habitats this meant it was necessary to use modelled data on habitat distribution over much of the MCZ Project area where other data were not available. This also reduced the risk of biasing site identification towards areas or habitat types which were well sampled or surveyed, and ensured that sites could be identified across the range of features listed in the Ecological Network Guidance. However, such modelled information may be judged to have low scientific confidence with respect to feature presence and extent.

Low confidence in the presence and extent of a feature within a recommended MCZ could result in an inaccurate recommendation, such that a feature is described as being present within the site when in reality it is not. This could have the following consequences:

- Failure to meet the guidelines in the Ecological Network Guidance (i.e. the feature is not present within the site and therefore MPA network representativity and replication guidelines are not achieved);
- Failure to provide protection to other examples of the feature which occur outside existing MPAs and other recommended MCZs (i.e. there is a high confidence example of the feature outside the MPA network);
- Failure to provide robust advice for implementation, including monitoring, assessment and management; and
- Loss of stakeholder support for site designation and MPA network development.

Given these difficulties JNCC and Natural England developed a paper to provide an overview of the levels of evidence anticipated for the different parts of the MCZ process – identification, recommendation, designation, and implementation (Vina-Herbon & Davies 2011). This paper is based on JNCC and Natural England's experience of other MPAs. Previous experience indicates that the type of evidence and the level of detail required increases as the process moves from the initial identification, through designation to implementation (monitoring, assessment and management). However, a precautionary approach to

[1] Best available evidence guidelines: 1.MCZ identification and designation should be based on the best available scientific evidence; 2 Lack of full scientific certainty should not be a reason for delaying network design and planning, including decisions on site identification; 3. MCZ identification should take account of local and lay knowledge.

designation and implementation may need to be taken where there is the risk of severe damage to, or complete loss of, the feature within a recommended MCZ. In such circumstances expectations regarding the type of evidence and level of detail for features within recommended MCZs may be lower.

Furthermore, Defra have outlined the information it expects to receive from JNCC and Natural England, the regional MCZ projects and the Science Advisory Panel to support the Government's decision-making on MCZs and to allow consultation in 2012 and designation in 2013 onwards[2].

What does this protocol cover?

This protocol sets out the methodology Natural England and JNCC will follow when producing their assessment of scientific confidence in the presence and extent of features in recommended MCZs as part of our advice package. The application of this protocol will take place between December 2011 and January 2012 using the data and information available at the start of the assessment. After this time further evidence sources will be logged and stored to inform future assessments of feature presence and extent. Feature presence and extent assessments may be updated after January if significant evidence becomes available and there is no risk to the achievement of the agreed timetable for producing our advice.

The protocol is also provided for public reference in order that our advice and the ways in which we make our decisions are made transparent and accountable.

Who is this protocol for?

This protocol applies to everyone in Natural England and JNCC who are directly engaged in the production of the relevant section of the MCZ advice.

Part 2: The protocol

Purpose of protocol

This protocol outlines a methodology that will be used to assess the scientific confidence of the regional MCZ project recommendations, specifically in terms of the presence and extent of features within recommended MCZs. Building upon the requirements described in the levels of evidence paper (Vina-Herbon & Davies 2011) it establishes basic principles for the assessment of confidence in the evidence available for features within recommended MCZs. Use of *Best Available Evidence* was appropriate for site selection and recommendation (Natural England & JNCC 2010). The emphasis is now on the evaluation of evidence to give a level of confidence on the quality and sufficiency of data to help inform SNCBs' advice and ministers' decisions associated with MCZ designation.

In assessing levels of confidence in the presence and extent of features within recommended MCZs we will consider the following questions:

- Is there measurable or verifiable evidence of presence of the features, including broad-scale habitats (BSH), Features of Conservation Importance (FOCI) and geological features of interest, in the site?
- Is there evidence of spatial extent of features in the site?

The scope of this protocol includes the amount and type of information available for each of the features, and the quality of the datasets used; for example age of the data, techniques for collection and the confidence of the habitat maps. It relates to the biological and physical evidence to assess the presence and extent of habitat, species and/or geological features. The assessment of scientific confidence of

[2] Defra (2011) Recommended MCZs – Advice and information to support Government decision-making (Version 3).

conservation objectives, including exposure and sensitivity of a feature to anthropogenic pressures is covered in Protocol F – Assessing scientific confidence of feature condition.

We will use the outcomes from the application of this protocol to:

1. Evaluate the scientific confidence of MCZ recommendations, as required by Defra, and contribute to the assessment of the scientific confidence in conservation objectives.

2. Prioritise areas for further evidence collection to improve the evidence base on the distribution of features (via data mining or primary survey), and to inform the development of a monitoring and surveillance programme over the coming years.

We will signpost in our advice where new evidence may become available (e.g. from new primary surveys and other sources) during or shortly after the current assessment exercise. Evidence collection is an on-going process and we will review/repeat our evidence assessments at appropriate stages in the future.

Overview of protocol

The assessment of scientific confidence is feature-based for each recommended MCZ, and considers evidence from several different sources. This evidence may be held nationally or locally by conservation organisations, public authorities, marine industries, or individuals. In completing the assessment a distinction has been made between the data available to assess the scientific confidence in the ***presence*** of a feature and of the ***extent*** of a feature.

- The assessment for the *presence* of the feature will indicate the scientific confidence of the feature being present within the proposed rMCZ.
- The assessment for the extent of the feature will indicate the scientific confidence in the location, area and spatial distribution of the feature within the site.

We will assess scientific confidence in presence and extent for all features within a recommended MCZ that have a draft conservation objective. However, recommended MCZs may include features that are not listed in the Ecological Network Guidance and Where these are highly mobile species (e.g. cetaceans, birds, fish and seals) the MCZ Technical Support Group paper '*Process for considering features not listed in the Ecological Network Guidance for protection through MCZs - section 3 Site specific feature evidence*'[3] should be followed.

The protocol relies on many criteria that are considered within quality assurance standards, and the outputs are in themselves a form of quality assessment. Quality assessments can be applied at many different points in data development and use, and will have different objectives depending on the questions being asked (ISO 19114:2003, Geographic information -- Quality evaluation procedures). However, any approach should ensure that the data or information is 'fit for purpose' – in this case the purpose being to describe the scientific confidence in feature presence and extent within recommended MCZs. There are many different attributes that can be used to assess and measure quality in data and information, and this protocol has drawn on those that are most relevant to the presence and extent of feature, including for example the method and date of collection.

This protocol is not designed to assess in detail all aspects of quality relating to individual sources of data, and relies on appropriate quality assessments being completed by the data owners. These quality assessments will include a range of different approaches or standards, which may be internally or externally applied. For example, the MESH confidence assessment (MESH Project 2007), species and biotope quality assurance (Langmead et al. 2010) or the National Marine Biological Analytical Quality Control Scheme (www.nmbaqcs.org). Hereafter in this protocol these will be referred to as 'quality assessments'. Where appropriate quality assessments are not available from the data owners this will be noted, and the information subjected to the protocol as outlined here.

[3] This will be uploaded on to the Natural England and JNCC websites in January 2012.

Please note that we will use the same criteria to assess presence and extent of recommended features in recommended Reference Areas (RAs).

Detailed protocol methodology

The protocol has been divided into three stages. In the first stage will document the evidence used by the regional MCZ projects to support their recommendations, including any associated quality assessment. In applying this protocol, this information will be complemented with additional national or regional dataset available to us but, as explained under the section on evidence sources and data, not documented in the regional project reports. The second stage will assess scientific confidence in presence of the feature, and the third stage will assess scientific confidence in extent of the feature (distribution assessment for species FOCI). These last two stages are summarised in Table 1 below, and further explanation of each of the stages can be found in sections 1, 2 and 3 of this protocol.

There may be exceptional or complex cases in assessing scientific confidence in presence and extent of a feature which do not conform to the structure provided in this protocol. Exceptional cases are those where the resultant confidence category may need to be adjusted after applying the protocol. Complex cases are those where the evidence available for the application of the protocol comes from many different sources and consists of many different data types, and as such makes application of the protocol very complex. In both cases it may be necessary to use some expert judgement in applying the protocol. However, all decisions and changes to confidence scores will need to be fully justified and documented. Exceptional and complex cases will be further reviewed by specialists within JNCC and Natural England, and these reviews will be documented.

Please note that presence and extent are not two independent attributes as the extent assessment builds upon the information available for the presence assessment. Both attributes will be assessed and recorded separately to maintain a sufficient level of detail. Our advice will contain summary tables for each of the rMCZs showing the information used in these assessments.

Table 1. Overview of the feature presence and extent assessment approach

	Broad-scale habitats	**FOCI habitats**	**FOCI species**
Presence of feature (see section 2 for more detailed descriptions of confidence criteria)	**High confidence** • Quantifiable or verifiable evidence to demonstrate feature presence, with most records in agreement. **Moderate confidence** • Quantifiable or verifiable evidence to demonstrate presence of 'parent'[4] feature, with many records in agreement.	**High confidence** • Quantifiable or verifiable evidence to demonstrate feature presence, with most records in agreement. For highly variable habitats only records up to 6 years old **Moderate confidence** • Quantifiable or verifiable evidence to demonstrate feature presence, with many records in agreement. For highly variable habitats records up to 12 years old.	**High confidence** • Quantifiable or verifiable evidence of species presence supported by multiple records up to 6 years old **Moderate confidence** • Quantifiable or verifiable evidence of species presence supported by multiple records up to 12 years old.

[4] In this protocol the parent feature refers to the EUNIS Level 2 habitat to which the broad-scale habitat belongs (e.g. the broad-scale habitat 'High energy circalittoral rock' belongs to the EUNIS Level 2 habitat 'Circalittoral rock'.

	Broad-scale habitats	FOCI habitats	FOCI species
	Low confidence • Unquantifiable or unverified evidence only to indicate feature presence; OR • Only one record available. **No Confidence** • Available evidence is conflicting with respect to habitat type.	**Low confidence** • Unquantifiable or unverified evidence only to indicate feature presence; OR • Only one record available. **No Confidence** • Available evidence is conflicting with respect to habitat type.	**Low confidence** • Unquantifiable or unverified evidence only to indicate feature presence; OR • Only one record available: OR • Records older than 12 years **No Confidence** • Available information indicates the species have been identified at the wrong location.
Extent or distribution of feature (see section 3 for more detailed descriptions of confidence criteria)	**High confidence** • Habitat extent supported by survey data (habitat map survey or remote sensing data) covering most of the feature; OR • Sample data distributed across most of the feature.	**High confidence** • Habitat extent supported by survey data (habitat map survey or remote sensing data) covering most of the feature; OR Sample data distributed across most of the feature.	**High confidence** • Records from surveys contain evidence on the distribution and/ or abundance of the species across and/ or within the site AND data are less than 6 years old.
	Moderate confidence • Habitat extent supported by survey data (habitat map from survey or remote sensing data) covering some of the feature; OR • Sample data distributed across some of the feature.	**Moderate confidence** • Habitat extent supported by survey data (habitat map from survey or remote sensing data) covering some of the feature; OR Sample data distributed across some of the feature.	**Moderate confidence** • Records from surveys contain evidence on the distribution and/ or abundance of the species across and/ or within the site AND data are less than 12 years old

	Broad-scale habitats	FOCI habitats	FOCI species
	Low confidence • Only modelled habitat map available; OR • Single sample record	**Low confidence** • Only modelled habitat map available; OR • Single sample record.	**Low confidence** • Records from surveys contain evidence on the distribution and/ or abundance of the species across and/ or within the site AND data are older than 12 years old.

1 Evidence sources

i. Evidence sources for recommended features

The source(s) of evidence used by the regional MCZ projects to support their MCZ recommendations must be documented for each recommended feature within a site (i.e. where a conservation objective has been set for a feature). In many cases the evidence will have been subjected to a quality assessment process against a specified standard. Where this is the case the specified standard and associated result of the quality assessment will also be documented.

Please note that quality assessments are not comparable across different standards as these have been developed for internal or individual project purposes. Additionally, a quality assessment may not be available for all sources of evidence[5]. However, all sources of data will be used to inform the application of this protocol, irrespective of whether they have undergone a quality assessment. For example, local knowledge from sea users has been used to support the presence and extent of features within recommended MCZs. Stakeholder participation and the knowledge of sea users were fundamental to the regional MCZ projects in developing their recommendations and whilst not always underpinned by a quality assessment it is valid and will be subjected to the protocol.

ii. Evidence sources used in application of the protocol

The assessment of scientific confidence in feature presence and extent needs to make use of a wider evidence base, where it is readily and publicly available, than that used by the regional MCZ projects to support their MCZ recommendations. This should include, for example, benthic habitat and species records that have not been captured in the aggregated evidence sources used by the regional MCZ projects, recent survey evidence and evidence from other organisations such as Cefas, the Environment Agency and the British Geological Survey. However, the assessment of feature presence and extent is a continuous process and assessments will need to be updated as existing data are made more readily and easily available and new data are collected.

In many cases these additional evidence sources will have been subjected to a quality assessment process against a specified standard. Where this is the case the specified standard and associated results of the quality assessment need to be documented. A quality assessment may not be available for all sources of evidence used in the protocol. Where evidence for a feature is only supported by such information this must be clearly noted, and the feature presence and/or extent confidence lowered by one category.

[5] JNCC and Natural England will make every effort to ensure that all sources of evidence are subject to a quality assurance and/ or confidence assessment process. However, the quality assurance/ confidence assessment standard applied may vary across different sources of evidence and may not always directly relate to questions of scientific confidence in feature presence and extent.

2 Assessing scientific confidence in the presence of a feature

i. Presence of broad-scale habitats

In assessing our scientific confidence in the presence of broad-scale habitats we will use the information available from habitat maps, ground-truthing data, modelled and local knowledge information. Table 2 shows an overview of the approach.

Table 2 Descriptions of confidence categories for broad-scale habitat presence assessment

High confidence	Quantifiable or verifiable evidence to demonstrate presence of feature, including: • Presence of feature shown by a habitat map with polygons containing biological validation samples; OR • Presence of feature supported by interpreted ground-truthing data (e.g. video, still image, grab, diver survey). For ground-truthing data multiple records should be available, and most records should be in agreement with respect to the habitat type with greater than 90% agreement in habitat type across records.
Moderate confidence	Quantifiable or verifiable evidence to demonstrate presence of feature, including: Presence of feature supported by interpreted ground-truthing data (e.g. video, still image, grab, diver survey, etc.). For ground-truthing data multiple records should be available, and many records should be in agreement with respect to the habitat type with greater than 50% agreement in habitat type across records; OR Quantifiable or verifiable evidence to demonstrate presence of 'parent'* feature within EUNIS classification hierarchy (e.g. EUNIS Level 2 Circalittoral rock, rather than EUNIS Level 3 High Energy Circalittoral rock): • Presence of 'parent' feature shown by a habitat map; OR • Presence of 'parent' feature supported by interpreted ground-truthing data (e.g. video, still image, grab, diver survey, etc.). For ground-truthing data multiple records should be available, and many records should be in agreement with respect to the habitat type with greater than 90% agreement in parent type across all records.
Low confidence	Modelled data only to indicate the presence of a feature[6]; OR Local knowledge information but ground-truthing sources to support it not available; OR Only one ground-truthing record available: OR Less than 50% agreement in habitat type suggested by ground-truthing records

[6] Includes habitat mapping studies with limited validation or unprocessed acoustic data

No confidence	Available evidence is conflicting with respect to habitat type

* Information on seabed type from the geological or hydrographic seabed samples could be used to verify whether the habitat type is rock based or sediment based. It may not always be possible to verify the type of sediment or energy level classification of the rock with this approach.

Where habitat maps are used in the feature presence assessment they should be subjected to the MESH confidence assessment (MESH Project 2007), which examines aspects such as sampling technique, date of collection, interpretation and density. Only those habitat maps that achieve a MESH confidence score of greater than 58% should be used in the feature presence assessment. A score of 58% in the MESH confidence assessment means that both acoustic data and biological ground-truthing data have been used to create the habitat map and inform the biotope classification (although there may only be limited quality assurance and/or no assessment of the map accuracy). Where habitat maps from survey have a MESH confidence assessment score below 58% the original input data should be used to inform the assessment – for example the ground-truthing and/or acoustic data themselves, rather than the derived habitat map. Please note that the confidence score is not being used to judge between categories, but to guide you as to how to use the information (i.e. original versus derived data). Individual ground-truthing datasets are also incorporated in the assessment, particularly on those areas where a habitat map MESH confidence assessment scores below 58%, and therefore no data are discarded within this approach.

The age or period of collection are not considered relevant for broad-scale habitats as these are primarily defined by their physical characteristics and as such are unlikely to change type over time. An exception could occur in inshore areas where habitat modifications caused by human activities might have changed the habitat e.g. change on coastal sedimentation patterns triggered by coastal development. In these cases a site-specific assessment using additional information, such as physical and energy data layers, may help to confirm the presence of the habitats.

Please note that as explained under the overview section, the approach relies on appropriate quality assurance and/or confidence assessments being completed by the data owners. If information from those is not available or incomplete and the dataset is the only information available for the broad-scale habitats it will not be possible to achieve a high confidence score for the assessment of presence and the confidence level should be decreased by one category.

ii. Presence of habitats of conservation importance

To assess our scientific confidence of the presence of habitats of conservation importance, take the approach shown in Table 3. This is very similar to the approach for broad-scale habitats, with the additional consideration of the age of the data used.

Table 3. Descriptions of confidence categories for habitat of conservation importance presence assessment

High confidence	Quantifiable or verifiable evidence to demonstrate the presence of the feature including: • Presence of feature shown by a habitat map with polygons containing biological validation samples; OR • Presence of feature supported by biotope-translated ground-truthing data (e.g. video, still image, grab, diver survey, etc.). For ground-truthing data, multiple records should be available and most records should be in agreement with respect to the habitat type with

	greater than 90% agreement in habitat type across records. Note that for those habitats that can show high temporal variability (e.g. ephemeral) the evidence should be less than 6 years old.
Moderate confidence	Quantifiable or verifiable evidence to demonstrate the presence of the feature including: • Presence of feature supported by biotope-translated ground-truthing data (e.g. video, still image, grab, diver survey, etc.) and records should be in agreement with respect to the habitat type with greater than 50% agreement in habitat type across all records). Note that for those habitats that can show high temporal variability (e.g. ephemeral) the evidence should be less than 12 years old.
Low confidence	Modelled data only to demonstrate presence of the feature[7]; OR Only one record available to demonstrate presence; OR Evidence is older than 12 years for those habitats that can show high temporal variability (e.g. ephemeral).
No confidence	Available evidence is conflicting with respect to habitat type.

For habitat FOCI we recommended that age and period of collection of the data are considered for those habitats that are naturally variable in terms of their temporal stability. This will minimise the possibility that a habitat is recorded as being present with high confidence when it is an ephemeral example of the habitat, and may not be currently present.

Those habitat FOCI considered to show high temporal variability include:

- Blue mussel intertidal beds on mixed and sandy sediments)
- Native oyster (*Ostrea edulis*) beds
- Honeycomb worm (*Sabellaria alveolata*) reefs
- Ross worm (*Sabellaria spinulosa*) reefs
- Seagrass beds

These habitat FOCI are known to be highly variable, over the scale of several years, with respect to their temporal stability (i.e. presence of live biogenic structures) (Hill et al. 2010). High confidence in presence of these habitat FOCI should only be assigned where the appropriate data sources are less than 6 years old. Moderate confidence should only be assigned to such features when presence in the last 12 years can be confirmed by the appropriate data sources. These times are chosen to reflect the 6 yearly reporting cycle outlined in the Marine and Coastal Access Act (2009). Please note that, as in the assessment for broad-scale habitats, in those cases where the only dataset available to demonstrate the presence of a habitat FOCI doesn't contain any information on QA procedures, it will not be possible to achieve a high confidence score in the assessment of presence and therefore the confidence level should be decreased by one category.

[7] Includes habitat mapping studies with limited validation or unprocessed acoustic data.

iii. Presence of species of conservation importance

To assess scientific confidence of the presence of species of conservation importance take the approach shown in Table 4. This is very similar to the approach for habitat FOCI, with the additional consideration of the taxonomic accuracy.

Table 4. Descriptions of confidence categories for species of conservation importance presence assessment

High confidence	Species presence supported by multiple records at one or more locations, all data are less than 6 years old AND information was collected using ground-truthing techniques appropriate for the assessment of the species and undertaken by specialists. At least five records will be required to demonstrate the presence of the feature.
Moderate confidence	Species presence supported by multiple records, with at least one record from between 6 and 12 years old, using ground-truthing techniques as described above; OR All records collected using ground-truthing techniques not specific, or designed for, the assessed species and undertaken without supervision by specialists AND data are less than 12 years old.
Low confidence	Species presence supported by single record, OR Records older than 12 years; OR Only anecdotal information available
No confidence	Available information indicates the species have been identified at the wrong location.

The regional MCZ projects and stakeholders have generally removed erroneous spatial records (e.g. native oysters at 250m depth). As such, recommended MCZs for species FOCI will include only those records that have been validated, in terms of their general location, during stakeholder discussions.

It may be necessary to undertake a more detailed assessment of scientific confidence for species presence, in particular to include aspects on species biology or life-cycle that can help us to refine and improve our approach.

There may be cases where you will find discrepancies between the age of records used to assess habitat and species FOCI. For example, records may relate to species that can form biogenic structures (e.g. *Ostrea edulis)*. In such cases the assessment needs to be made according to the relevant type of feature that has been put forward for recommendation – either the habitat FOCI or the species FOCI.

3 Assessing scientific confidence of feature extent

i. Broad-scale habitat and habitat FOCI extent

Assessment of the extent of a feature should indicate the scientific confidence in the location, area and spatial distribution of the feature within the site. The scientific confidence of extent is an important parameter because it helps us to assess the information that was used to draw boundaries for recommended MCZs, and will be used to inform confidence of conservation objectives that have been determined through a vulnerability assessment.

Modelled information from UKSeamap is available for all regional projects, and in some cases additional information from sampling surveys, acoustic surveys or additional data collection etc are also available to verify the extent of broad-scale habitat and habitat FOCI. Data coverage, including sampling density and sampling distribution, can provide an indication of the location, area and spatial distribution of feature within the site. This information should be used to assess the scientific confidence of a features location.

In assessing scientific confidence of feature extent, you should consider including:

- Coverage of source data (polygon)
- Density of source data (point)
- Distribution of source data (i.e. patterns of point and/or polygon distribution)

The proposed approach to assess scientific confidence in the extent of broad-scale habitat or habitat FOCI is outlined below.

Table 5. Descriptions of confidence categories for the broad-scale habitats and habitats FOCI extent assessment.

High confidence	Habitat extent supported by a habitat map (from survey)* covering more than 50% of the recommended feature; OR Sample data well distributed across more than 50% of the recommended feature: OR Combination of both types of data covering more than 50% of the recommended feature
Moderate confidence	Habitat extent supported by a habitat map (from survey)* covering less than 50% of the recommended feature; OR Parent feature extent support by a map covering more than 50% of the recommended feature; OR Sample data covering less than 50% of the recommended feature: Combination of data covering less than 50% of the recommended feature
Low confidence	No habitat map (from survey) available; OR Single sample data record: OR Only modelled map.

* See comments earlier on use of raw remote-sensing data for some features.

When analysing the number and distribution of sample records over the feature it is essential to use only information that supports the presence of the feature.

Please note that the 50% threshold proposed in the table above has been chosen to indicate that at least more than half of the potential extent of a feature in a site is covered by additional information other than modelled data.

ii. Species distribution

Extent is not an appropriate parameter to evaluate the evidence on the spatial distribution of a species in the same way as it is for broad-scale habitat or habitat FOCI. This is due to the high temporal and spatial variability on the location and abundance of species. This variability is linked with the life cycle, reproductive strategy, survival of juveniles and behaviour of each species. For example the distribution across a particular area will be highly dependent upon the success of their recruitment season and the survival of juveniles, and the effect of any natural or human induced pressures interacting upon them. Also, there could be remarkable differences on distribution and abundances between the growing season in spring and summer months, and winter months. Some species, such as Peacock's tail are annual, which means they die down in the autumn to reappear the next summer.

Table 6. Descriptions of confidence categories for the species FOCI distribution assessment.

High confidence	Records from surveys contain evidence on the distribution and/ or abundance of the species across and/ or within the site AND data are less than 6 years old.
Moderate confidence	Records from surveys contain evidence on the distribution and/ or abundance of the species across and/ or within the site AND data are less than 12 years old.
Low confidence	Records from surveys contain evidence on the distribution and/ or abundance of the species across and/ or within the site AND data are greater than 12 years old.

Please note that the considerations on the type and approach to data collection, for example the techniques used for survey of the species, are the same as for the presence of the species.

The information should be evaluated using all types of information available to Natural England and JNCC, including data on the abundance of species across the area, population structure information (e.g. proportion of adult versus juveniles), density and distribution of the species or video recording information. The localised nature of some species on a site, for example a species associated with rocky areas but imbedded on a large patch of sand, means that in some cases the distribution will be limited to only one location. In this case the level of confidence could be increased if the relevant information and justification for the change of confidence is clearly explained.

The narrative accompanying the evidence for those species showing a low level of confidence should contain any additional observations made by the assessor(s). This narrative should indicate if the geomorphological or physical characteristic of the site suggests that the species could be present across a wider area, but information is not currently available to confirm this.

Summary

- Defra has requested SNCBs to undertake an assessment of the scientific confidence of MCZ recommendations;
- The assessment of scientific confidence should be feature-based for each recommended MCZ, and consider evidence from several different sources, which may be collected by several different organisations;
- The proposed methodology makes a distinction between the presence and extent of features;
- For the assessments of scientific confidence in presence and extent the following three categories will be used: High confidence, Moderate confidence and Low confidence or uncertain;

- The assessment for the presence of the feature should indicate the scientific confidence in the feature being present at the time of site recommendation. The assessment of the extent of the feature will indicate the scientific confidence in the location, area and spatial distribution of the feature within the site;

- The presence of a feature should be based on both habitat maps and sample survey data with biological ground-truthing information. Additional consideration of the age of the data being used is only taken into account for habitats and species FOCI; and

- A draft worked example is provided in Annex 4 for the Canyons recommended MCZ. Note this is draft worked example, and the final results in assessing scientific confidence in feature presence and extent for the Canyons recommended MCZ may differ.

References

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- Langmead, O., Jackson, E.L., Griffiths, C., Wilkes, P., Neilly, M., Lear, D., Luckraft, I., Foggo, A.,& Tyler-Walters, H. 2010. *Accessing and developing the required biophysical datasets and data layers for Marine Protected Areas network planning and wider marine spatial planning purposes*. Report to the Department of Environment, Food and Rural Affairs from the Marine Life Information Network (MarLIN) Plymouth: Marine Biological Association of the UK, subcontracted by ABPmer, Southampton. Defra Contract No. MB0102 Task 2F,Report No. 20.

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- Natural England and the Joint Nature Conservation Committee (2010). *The Marine Conservation Zone Project: Ecological Network Guidance.* Sheffield and Peterborough, UK.

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- Ramsay K, Lough, N. & Bayley D. 2011. *Data sources, process for selecting Focus and Potential Sites and data confidence.* Technical report CCW (Draft).

Annex 1: Implementing and communicating the protocol

The lead authors from JNCC and Natural England will be responsible for ensuring the protocol is implemented. They will ensure that all internal contributors to the MCZ advice will have a copy of the protocol and understand the requirements.

Defra's Marine Biodiversity team, Chief Scientific Advisor, Defra Arms Length Bodies, the Independent External Review Group, and wider stakeholders were invited to review the draft protocol and provide comments to Natural England and JNCC. Natural England and JNCC have considered all the comments received and updated the protocol accordingly. Comments received, and the draft and final protocols will be accessible on JNCC and Natural England's website.

Annex 2: Monitoring and review

Lead authors will monitor assessments and draft advice from section leads to ensure the protocol is followed. An independent expert review panel will assess whether the draft advice package is consistent with the protocol.

This protocol is currently time limited for the duration of the SNCB advice on MCZ recommendations. The MCZ Project Board may commission a review of the protocol in the light of any changes to timetables or policies.

Annex 3: Related documents

TBC:

Equality impact assessment - TBC

List of all of the MCZ advice protocols:

A. Strategic protocol – the principles by which advice will be formulated;
B. Quality control, assurance and peer review;
C. Document style and language;
D. Audit trail – version control and record keeping;
E. Assessing the scientific confidence of the presence and extent of features in recommended marine conservation zones;
F. Assessment of the scientific confidence of conservation objectives;
G. Assessing Marine Conservation zones most at risk;
H. Assessing the contribution of existing sites to the network.

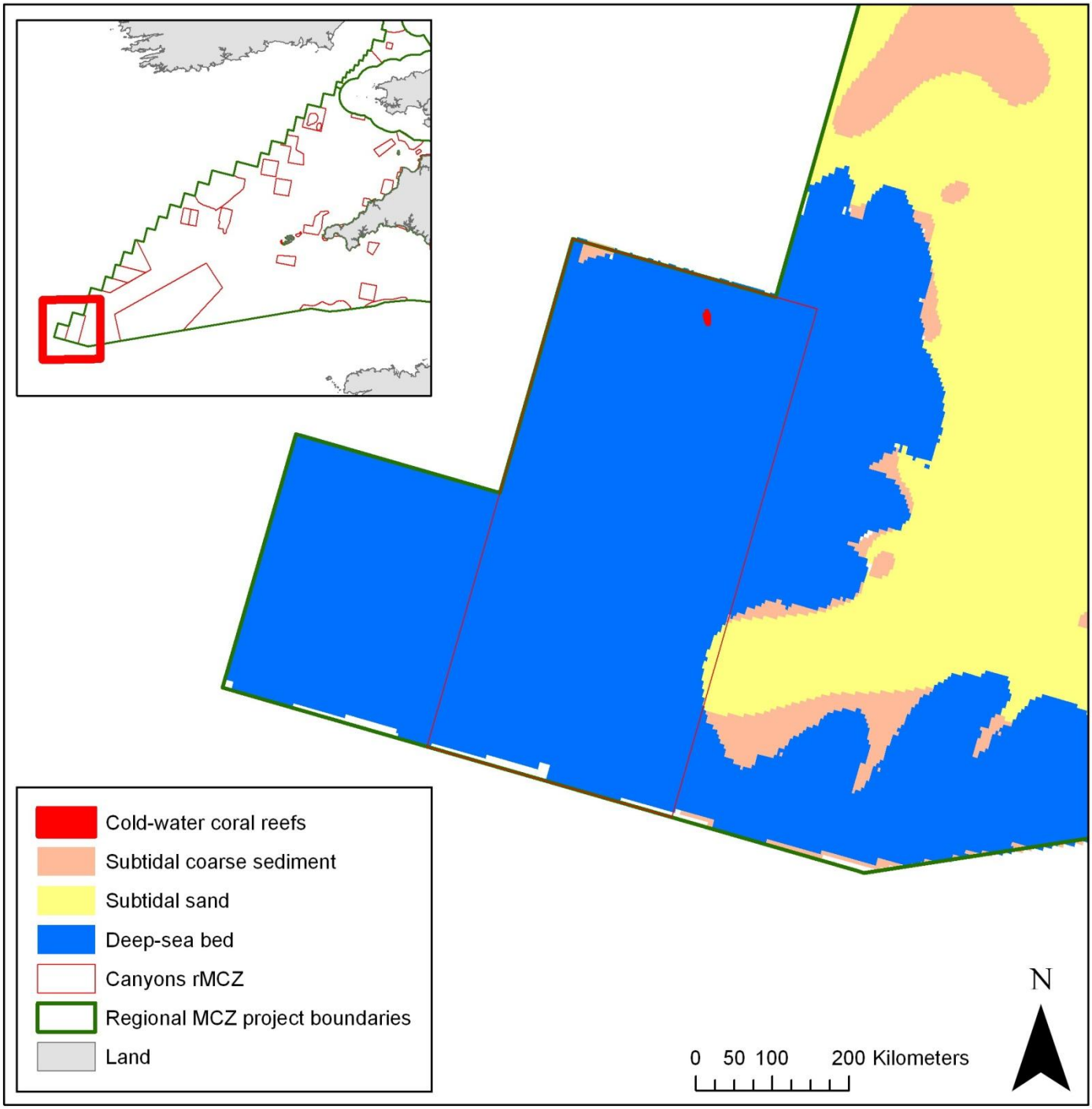
Annex 4: Draft worked example of assessing scientific confidence in feature presence and extent in rMCZs

The canyons rMCZ in the Finding Sanctuary project area is used here as a draft worked example to demonstrate the application of this protocol.

Four features have been given Conservation Objectives within the Canyons rMCZ (Figure 1), these include:

- Cold water coral reefs (habitat FOCI)
- Deep-sea bed (broad-scale habitat)
- Subtidal coarse sediment (broad-scale habitat)
- Subtidal sand (broad-scale habitat)

Figure 1: Map showing features within Canyons rMCZ



JNCC advise that Conservation Objectives should not be assigned to the broad-scale habitats subtidal coarse sediment and subtidal sand. These two broad-scale habitats within the Canyons rMCZ are very small portions of much larger and continuous habitat patches that extend across the south-west approaches. As such, scientific confidence in presence and extent for these two features is not assessed here.

The evidence sources used in application of the protocol are recorded in Table 1 and mapped in Figure 2, and the results of the protocol are recorded in Table 2. Note that this is draft worked example, and that the final results in assessing scientific confidence in feature presence and extent for the Canyons rMCZ may differ.

Figure 2: Map showing evidence sources used in assessing scientific confidence in presence and extent of features in the Canyons MCZ

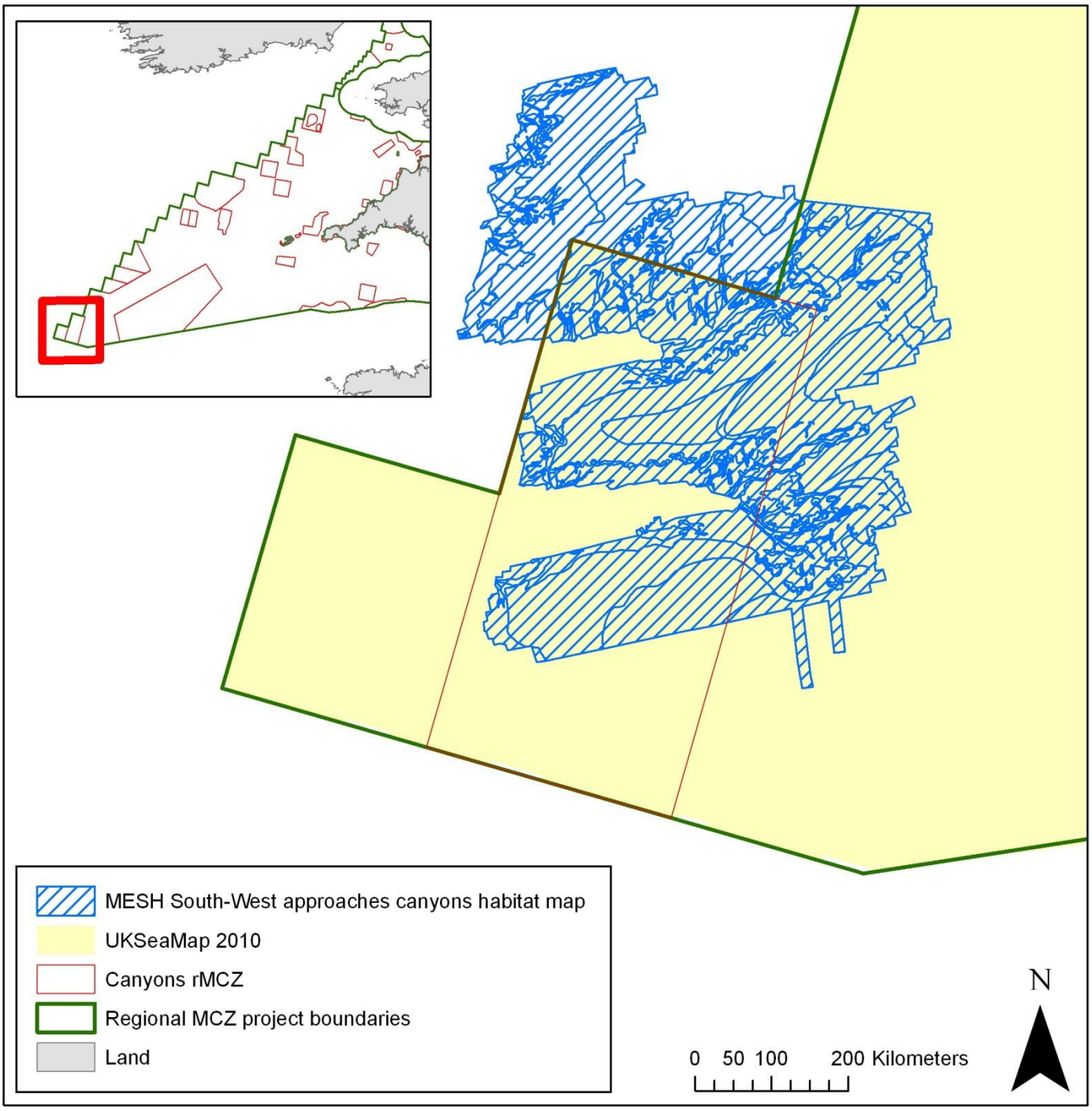


Table 1: Evidence sources used in assessing scientific confidence in presence and extent of features in the Canyons rMCZ

Feature type	Feature Name	Evidence source(s)	Date collected	Quality assessment applied	Quality assessment score
Habitat FOCI	Cold-water coral reefs	MESH South-West approaches canyons habitat map (GUI : GB000971)	2007	MESH confidence assessment	83/100
Broad-scale habitat	Deep-sea bed	UK Seamap 2010	Not known	UKSeaMap confidence	Ranges across feature from 0 – 70/ 100
		MESH South-West approaches canyons habitat map (GUI : GB000971)	2007	MESH confidence assessment	83/100

Table 2: Results from assessing scientific confidence in the presence and extent of features for the Canyon rMCZ

	Presence		Extent	
Feature name	Scientific confidence	Justification	Scientific confidence	Justification
Cold water coral reefs	High	The MESH South-West approaches canyons habitat map is based on survey data, including acoustic and biological-ground-truthing, and has a confidence score >58%. Polygons for cold water coral reefs contain biological validation samples.	High	The MESH South-West approaches canyons habitat map covers 100% of the recommended location for cold water coral reefs.

Feature name	Presence		Extent	
	Scientific confidence	**Justification**	**Scientific confidence**	**Justification**
Deep-sea bed	High	The MESH South-West approaches canyons habitat map is based on survey data, including acoustic and biological-ground-truthing, and has a confidence score >58%. Polygons for the deep-sea bed broad-scale habitat contain biological validation samples.	Moderate	The MESH South-West approaches canyons habitat map covers less than 50% of the recommended location for the deep-sea bed broad-scale habitat, with the remainder of the feature covered by UKSeaMap 2010.